

Integration, Coordination, and Concentration in the Fresh Fruit and Vegetable Industry

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Abstract: There is a widely held perception that contracts in the fresh fruit and vegetable industry are changing, and that both vertical and horizontal integration and coordination are playing larger roles. This paper examines available data and anecdotal evidence, and finds that severe data shortages make it difficult to confirm or refute general perceptions.

Keywords: Vertical integration, vertical coordination, horizontal integration, horizontal coordination, contracts, concentration, fresh fruits and vegetables.

Introduction

Agricultural economists, policymakers, and members of the horticultural industry are concerned about structural change—specifically, changing contractual relationships among firms that grow, move, and sell fresh fruits and vegetables—and the effect on profits, food quality, and consumer well-being. While these kinds of concerns about market structure have long been present in the broiler, livestock, and processed foods industry, they are just now emerging in the fresh fruit and vegetable industry. The recent focus on market structure in horticulture appears to be driven by several striking trends. First, anecdotal evidence suggests that marketing contracts, production contracts, strategic alliances, and mergers are becoming more common. Second, firms are changing, and these changes are “big”—farms are bigger, wholesalers are bigger, and retailers are bigger. At the same time, consumer demand for a wide variety of high quality fruits and vegetables is growing. As a result, retailers are devoting an increasing amount of their limited shelf and floor space to the fresh produce department.

Reaction to these phenomena has focused on how structural change affects market concentration at each level of the marketing chain, and on business practices between suppliers and retailers. Policymakers are trying to understand the connection between changing market structure and the observed new kinds of contracts, representing new relationships among growers, wholesalers, brokers, and retailers. By contract, we mean a formal or informal agreement between two parties that is costly to break, where the cost can be either a monetary penalty or lost future business.

Contractual relationships are important, because they ultimately determine how growers, middlemen, and retailers share production risk and price variability, and influence both the distribution of and level of quality available in the market. Finally, these contracts also affect consumer prices. In other words, contractual form influences consumer well-being (through retail prices and quality available) and industry well-being (through profits, market share, and market access), making understanding horticultural market structure a pressing policy issue.

Contracts, Coordination, and Integration

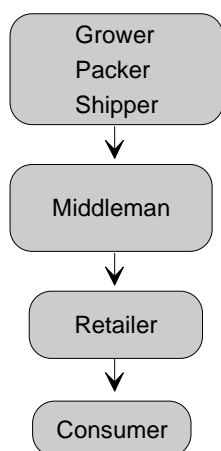
The movement towards larger firms has evolved in two basic ways—through direct ownership, by which firms grow larger, or through agreements, by which firms are effectively larger. The first case is known as integration, which refers to mergers or acquisitions, where one firm purchases the assets of another firm. In the second case, known as coordination, firms gain access to larger markets, a wider product line, or higher quality produce through formal or informal agreements. Firms will agree to integrate or coordinate when they expect that doing so will ultimately result in higher profits. What is not as clear, however, is how changing contracts at one level of the marketing chain affect consumers and firms at other levels of the marketing chain. Figure A-1 shows a stylized version of the path fresh fruits and vegetables follow from farm to consumer. The journey begins at the shipping point, where fresh produce is grown, packed, and shipped. Next, fresh produce passes through middlemen, either wholesalers or brokers, then to retailers, and finally to consumers.

Horizontal integration refers to mergers within one level of the marketing chain, such as retailers merging with other retailers or shippers merging with other shippers. Similarly, horizontal coordination takes place within one level of the

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Figure A-1

Fresh Fruits and Vegetables: From Grower to Consumer



farm-to-market chain, for example, wholesalers making agreements with other wholesalers or shippers making agreements with other shippers. Vertical integration refers to mergers between two levels of the marketing chain, for instance, between wholesalers and retailers or shippers and packers. In the same vein, vertical coordination refers to agreements between two levels, for example, between shippers and growers.

Understanding coordination and integration requires a grasp of both the law and economics. Whether a proposed merger can take place or whether a particular contract is valid is ultimately a legal decision. The law, however, leans on economic factors when deciding whether a particular merger or contract should be allowed, and relies on the ideals that businesses should have the opportunity to compete fairly and that consumers should have access to a wide variety of products at low prices. These principles have been manifested in three acts, referred to as the “Magna Carta of Free Enterprise”: the Sherman Act, Clayton Act, and Federal Trade Commission Act (Posner, 1998). The Federal Trade Commission (FTC) and Department of Justice enforce these three acts, plus the Robinson Patman Act, which regulates firms’ pricing schemes (Shenefield and Stelzer, 1996).

When deciding whether to allow a particular horizontal merger, such as a proposed supermarket merger, either the Federal Trade Commission or the Department of Justice examines the market to determine if the merger is likely to reduce competition. If there is evidence of a possible reduction in competition, the FTC uses its 1992 guidelines to assess the economic impact of the proposed merger.² This assessment is based on market conditions, including concentration, before and after the merger. If concentration is expected to rise significantly, the newly merged firm may

have the ability to restrict supply into the market or to raise consumer prices.

The first part of the market analysis, according to FTC guidelines, defines which market the merger affects, and considers all substitute goods and services. Next, FTC economists establish the relevant geographic market that would be affected by the merger. If the industry is not concentrated, the FTC will allow the proposed merger to take place. If the analysis reveals that the industry is moderately or highly concentrated, analysts estimate how easily new firms can enter the industry, and how likely new entry will be. Depending on the results of the analysis, the FTC may either permit the merger, or require the firms to agree to change some terms of the merger agreement.

Vertical integration, which might be a merger between a wholesaler and a retailer, also comes under the jurisdiction of the FTC. The Sherman Act prohibits vertical mergers and price agreements that restrain trade. Yet, in practice, it is quite difficult to assess the impact of most vertical agreements, with the exception of two situations. Mergers that increase barriers to entry may not be allowed, since increased barriers to entry may lead to higher consumer prices. Also, the FTC prohibits mergers that facilitate collusion, since collusion might force a competitor to leave the industry, which potentially increases consumer prices. Other contractual agreements, such as price and non-price restraints, such as setting minimum prices, exclusive territories, and customer restrictions, potentially harm consumers by preventing prices from being competitively set. Most forms of price restraints violate the letter of the Sherman Antitrust Act, but in practice, enforcement takes place on a case-by-case basis, using “rule of reason” as the guideline (Shenefield and Stelzer, 1996).

These kinds of contractual relationships—horizontal and vertical integration, and coordination—potentially make some firms and consumers worse off. On the other hand, these contracts may provide benefits to consumers and firms. Horizontal integration may make it possible for firms to take advantage of economies of scale, and undertake an investment that would be prohibitively costly for a smaller firm. For example, large Washington D.C. area supermarkets such as Safeway and Giant have invested in expensive on-site banana ripening facilities, which make it possible for consumers to have access to uniformly ripe bananas year-round (Washington Post, February 5, 1999).

Vertical integration offers similar benefits by reducing the likelihood of one party taking advantage of another. For example, suppose a grower produces a commodity for a particular shipper, one that meets specific quality standards or requirements (such as an organic apple). After harvest, there may be an incentive for a shipper to decide not to purchase the good or to pay an extremely low price. Unless the grower has another buyer nearby, ready to buy the specific

²The guidelines are online at <http://www.ftc.gov/bc/docs/horizmer.htm>.

product, the grower may realize a loss. As a result, the grower may choose to produce a less-specialized, more easily marketable commodity. If the grower and shipper were vertically integrated, it would be less likely that the shipper could take advantage of the grower, and so the specific product would be grown. As a result, consumers will be better off. In general, consumers will benefit from vertical integration whenever production requires or generates a specific asset (Hart, 1995; Williamson, 1985).

In general, most agricultural commodities grown under contract are produced by coordinated (rather than integrated) firms. For example, most fresh market lettuce and carrots, and virtually all processed vegetables, are grown under contracts specifying a coordinated production process. The contract typically specifies which seeds to use, the varieties to grow, which fertilizer and other chemical inputs to use, and may even specify that the contracting firm provide these inputs to the grower. In addition, the contracting firm usually monitors crop growth by periodically inspecting the fields. The firm may also harvest, pack, and market the crop. After harvest, the contracting firm frequently performs laboratory tests, for quality, on the crop. Shippers enter these kinds of contracts to control quality, as well as to lock in a supply of high quality produce. Another motivation for coordination is to make certain commodities such as tomatoes and lettuce available year-round. In this case, shippers may contract with growers in different domestic and international regions. For example, West Coast lettuce production shifts from Salinas, CA to Huron, CA to Yuma, AZ, while East Coast tomato production shifts from various counties in Florida to South Carolina to Maryland or Virginia. Florida firms may also coordinate with Mexican producers (Wilson, Thompson, and Cook, 1997).

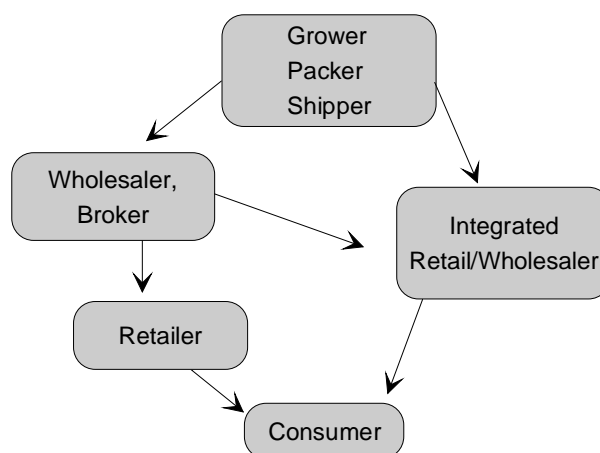
From Grower to Consumer—The Changing Marketing Chain

Figure A-2 provides a stylized version of the fresh fruit and vegetable marketing chain. The first stage—production and preparing produce for shipment—comprises the grower, packer, and shipper. There are many possible combinations of growing, packing, and shipping. In some cases, one firm grows, packs, and ships, for example, while in other cases one firm grows and another packs and ships. At this point, produce can either be sold to retailers by a broker or delivered to the terminal market, where it is sold to retailers by wholesalers. A retailer's choice about whether produce should be purchased from a broker or a wholesaler depends on a number of factors: quality of produce available, prices, varieties available, reputation of seller, and any long-term relationship between the seller and buyer.

There are some instances when a specific variety, quality, or quantity is desired. In these cases, retailers may buy directly from the shipping point to make sure their needs are met. The practice of direct buying began in the early 1920's,

Figure A-2

Fresh Fruit and Vegetable Marketing Chain



when national supermarket chains first appeared (Manchester, 1964). The practice continued to grow as local and regional chains began purchasing directly from the shipping point. By 1936, 12 percent of the produce delivered to terminal markets had been purchased before delivery. In 1936, however, all fresh fruits and vegetables were delivered to terminal markets, even the shipments that were purchased directly from the shipping point.

To facilitate transactions and reduce costs, large retailers began creating central buying systems, which included hiring produce buyers and building produce warehouses. And by 1958, all three national chains, plus five regional chains, had a system for central buying, and were buying at least some of their produce directly from the shipping point. Larger firms bought more produce directly from the shipping point, and subsequently bypassed the middleman part of the chain. In 1958, all chains with sales exceeding \$100 million purchased at least some produce directly, national chains purchased 70 percent of their produce directly, and regional chains bought 52 percent directly. The emergence of supermarket-owned warehouses changed the marketing chain, as these large retailers now had the facilities to act as their own wholesalers (Manchester, 1964).

Retailers were now able to purchase produce through independent brokers, from wholesalers in the terminal market, or by using their own salaried buyer to purchase shipments to be delivered to their warehouses. Integrating reduced transaction costs of purchasing fresh fruits and vegetables because retailers could purchase large quantities directly from one or two suppliers rather than buying from many small suppliers. Other benefits included the possibility of developing long-term relationships with growers, the potential to increase profits by circumventing traditional wholesalers and brokers, and the ability to acquire produce with specific characteristics. Growers and suppliers, in particular

those with large crops, were able to sell to one or two large buyers, rather than relying on many smaller buyers in the terminal market. These growers and suppliers also benefited from establishing long-term relationships with buyers—disputes over quality were more easily solved when dealing with a firm that was a consistent trading partner.

Anecdotal evidence suggests that the tendency to purchase fresh produce directly from the shipping point has increased as the number of large retailers has grown. Confirming this notion is difficult, because there is little data describing the flow of produce from farm to consumer. There are only three comprehensive studies that give a picture of fresh fruit and vegetable marketing channels. The first was an ERS study done by Manchester in 1958 (and published in 1964), and the others, by McLaughlin, which examined the industry in 1993 and 1996. In addition, there are two other studies from 1973 and 1982, cited by McLaughlin in his 1994 work. Despite the different sources and the data shortage, these studies give us some insight into industry-wide trends. For example, the proportion of produce purchased directly from shippers increased until 1993, when over half of the fresh produce was purchased directly (table A-1); this share decreased to 41 percent just 3 years later. The share sold through brokers declined from 1982 on, while the share sold through the terminal market fell to 20 percent in 1993, but increased to 34 percent in 1996.

The share of produce purchased directly from the shipping point by the largest firms exceeds the share purchased by the smaller firms (table A-2). In 1993, the largest supermarkets (those with annual sales exceeding \$1.5 billion) purchased 93 percent of their produce directly from the shipping point. Smaller supermarkets (those with sales less than \$300 million) purchased 65 percent from the shipping point. In 1996, the largest supermarkets purchased 84.5 percent directly from the shipping point. Mid-sized supermarkets (those with annual sales between \$300 million and \$1.5 billion) purchased 63.4 percent, and smaller supermarkets, 34.8 percent. These statistics indicate that direct purchasing decreased for all supermar-

Table A-1--Proportion of produce purchased from shippers, brokers, and through the terminal market

Year	Shipper	Brokers	Terminal market
	Percent		
1973	39.0	28.5	32.5
1982	40.9	33.9	27.0
1993	53.0	27.0	20.0
1996	41.1	24.6	34.3

Note: The original source for the 1973 and 1982 data is Marcom Research, as reported in McLaughlin and Perasio, 1994. The shares for 1982 sum to more than 100 percent.

Source: *Fresh Fruit and Vegetable Procurement Dynamics: The Role of the Supermarket Buyer*, McLaughlin and Perasio, 1994; *Marketing and Performance Benchmarks for the Fresh Produce Industry*; McLaughlin, Park, and Perasio, 1997.

kets from 1993 to 1996, but the decline is greater for the smaller supermarkets. The reason for the decline is not readily apparent, and it is also unclear whether the decreasing trend will continue. The data describing changes in the flow of produce over time suggest that there is a strong relationship between the size of the retailer and the way in which fresh fruits and vegetables are purchased.

The Farm Level: Growers

There has been a general movement toward fewer, larger farms in the vegetable and fruit industries. Figure A-3 shows average size of vegetable farms and orchards. According to the Agricultural Census, average vegetable farm size increased at each 5-year interval between 1982 and 1997. Only farms greater than 250 acres increased in number throughout the period (figs. A-4 and A-5). The number of farms between 50 and 250 acres increased until 1992, but were fewer in 1997. All but the smallest farms, those with less than 1 acre, declined in number between 1982 and 1997, and the smallest farms increased in number after 1987. The data lend support to the perception that the industry is moving toward producing most vegetables on large

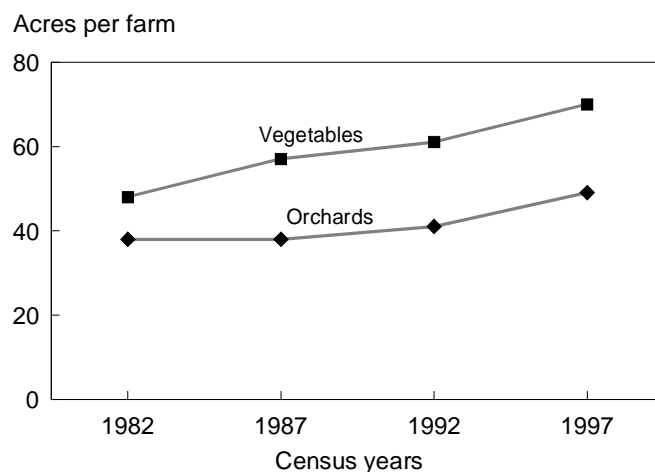
Table A-2--Proportion of produce purchased directly from shipping point by Supermarket size

Size by annual sales	1993	1996
	Percent	
More than \$1.5 billion	93	84.5
\$300 million - \$1.5 billion	na	63.4
Less than 300 million	65	34.8

na = Not available.

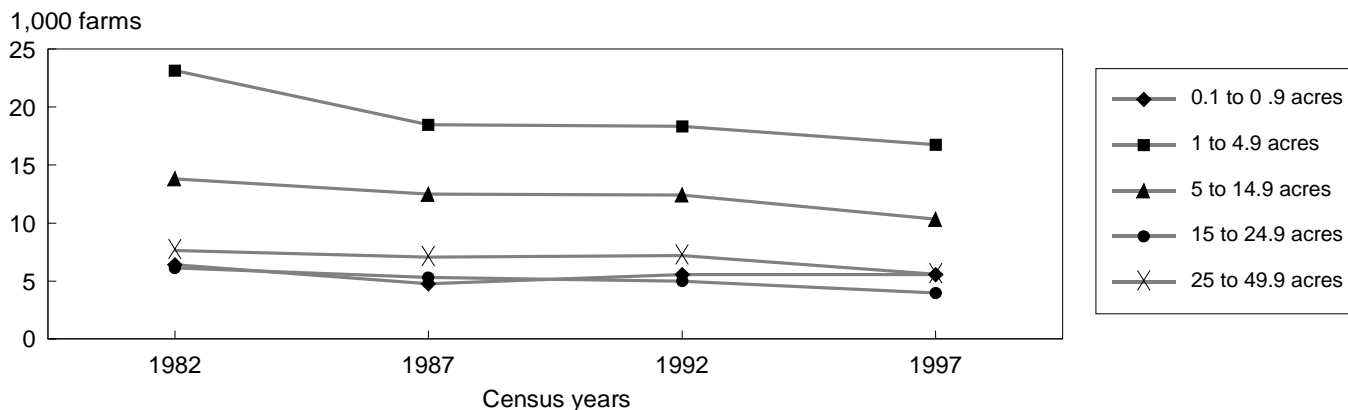
Source: *Fresh Fruit and Vegetable Procurement Dynamics: The Role of the Supermarket Buyer*, McLaughlin and Perasio, 1994; *Marketing and Performance Benchmarks for the Fresh Produce Industry*; McLaughlin, Park, and Perasio, 1997.

Figure A-3
Average Orchard and Vegetable Farm Size



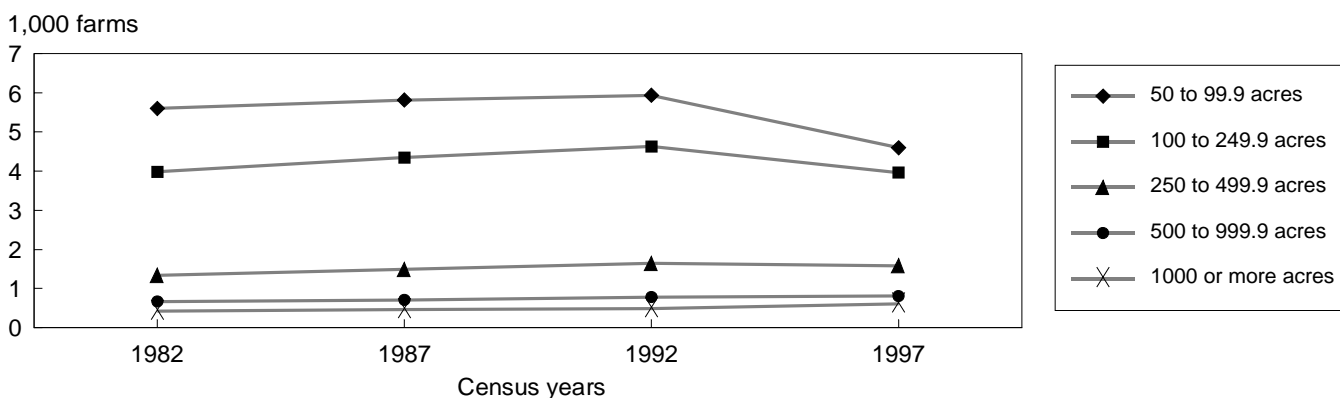
Source: Census of Agriculture.

Figure A-4

Vegetable Farms Less Than 50 Acres

Source: Census of Agriculture.

Figure A-5

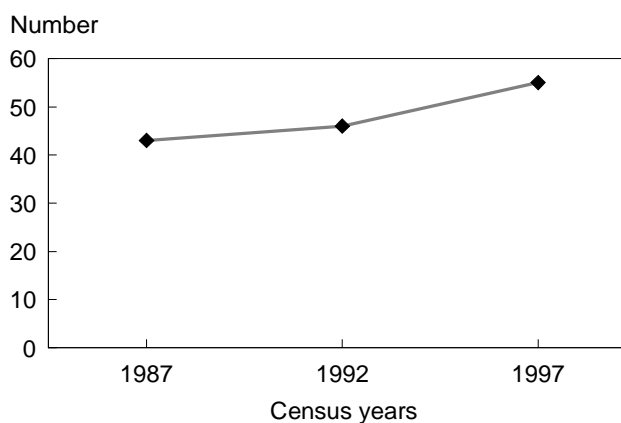
Vegetable Farms Larger Than 50 Acres

Source: Census of Agriculture.

farms, while efforts to meet demand for so-called niche products have led to an increase in the number of small farms. The Census also reports farm concentration, or the number of farms that sold 10 percent of the market value of vegetables, sweet corn, and melons. The number of firms selling 10 percent of the market value increased over the three 5-year intervals, suggesting that despite fewer farms overall and growth of large farms, the market has actually become less concentrated (fig. A-6).

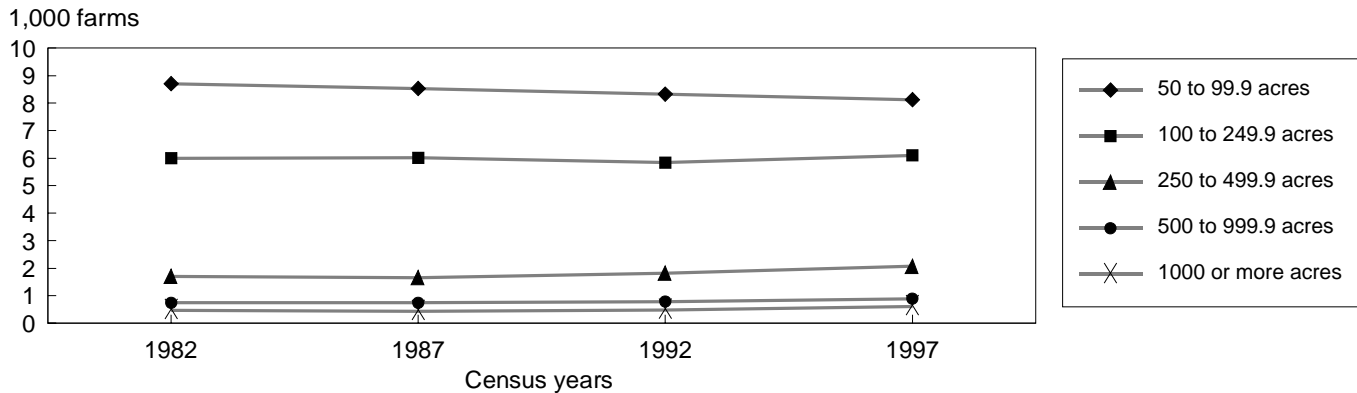
Average orchard size first slightly decreased, and then increased between 1987 and 1997 (fig. A-3). The number of orchards greater than 50 acres has remained relatively constant or increased between 1982 and 1997 (fig. A-7). Similarly, the number of orchards less than 50 acres remained fairly constant (fig. A-8). Market concentration of fruits, nuts, and berries did not significantly change between 1982 and 1997, and show the number of farms selling 10 percent of market value first decreased, then increased (fig. A-9).

Figure A-6

Farms Selling 10 Percent of the Market Value of Vegetables, Sweet Corn, and Melons

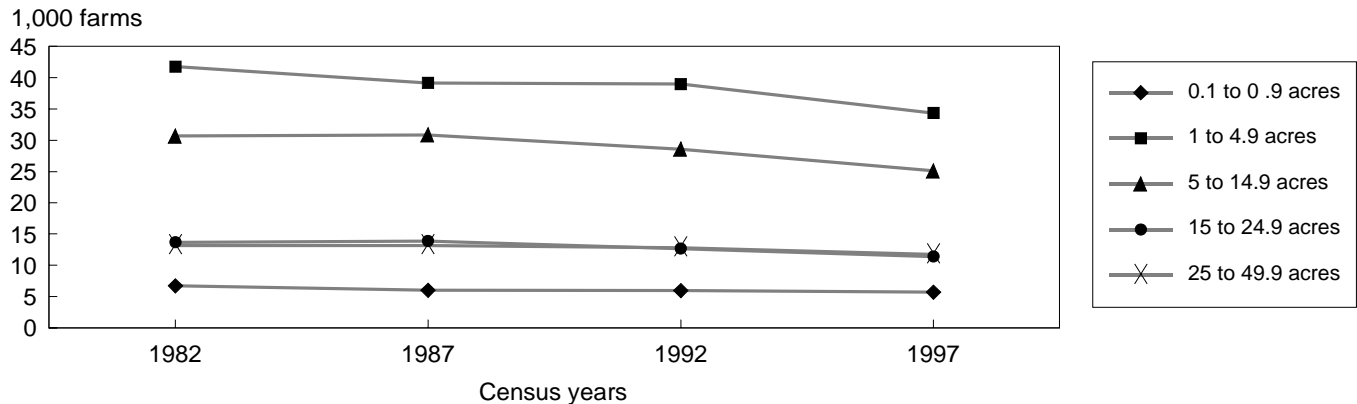
Source: Census of Agriculture.

Figure A-7

Farms With Orchards Larger Than 50 Acres

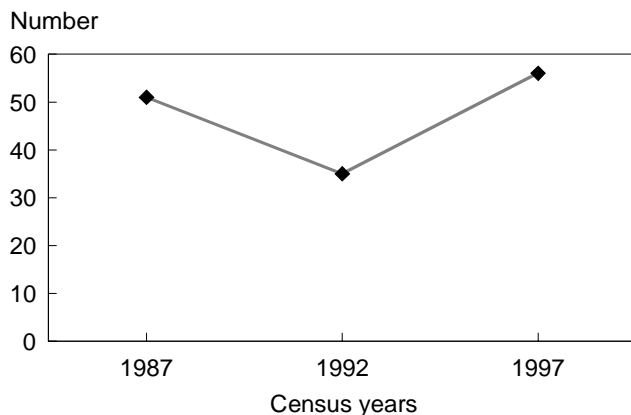
Source: Census of Agriculture.

Figure A-8

Farms With Orchards Smaller Than 50 Acres

Source: Census of Agriculture.

Figure A-9

Farms Selling 10 Percent of the Market Value of Fruits, Nuts, and Berries

Source: Census of Agriculture.

The First Intermediary: Shippers

Neither the U.S. Commerce Department's Economic Census of the Wholesale Trade nor the Agricultural Census focuses specifically on fresh fruit and vegetable shippers, and as a result, there is no national-level source of information detailing either the current or historical number of shippers and packers operating in the produce industry. Contracts in parts of the vegetable industry, specifically tomatoes, lettuce, and melons, have been closely examined. For example, Wilson, Thompson, and Cook surveyed 81 grower-shipper firms in California, Arizona, Mexico, and Florida, and uncovered information about how these firms obtain supplies. Calvin and Barrios surveyed Mexican growers. Currently, Hueth and Ligon are surveying California shippers to add to our understanding of contracts between California shippers and growers. Most of the current detailed information about transactions is for fresh vegetables, and to the best of our knowledge, there is little infor-

mation describing the fruit industry. This data shortage forces us to rely on anecdotal evidence to gain some insight into changes taking place in the fruit industry.

It appears that a great deal of structural change has already taken place in the fresh vegetable industry. Most of the contracting arrangements were new vertical relationships between shippers and growers, where the vertical relationships were instituted both through direct ownership and contracting. One significant factor driving contractual change was an effort to obtain year-round supplies of produce. With year-round grower-shippers supplying the market, shippers have an increased incentive to invest in seed development and merchandising (Wilson, et al 1997). In contrast, relationships among fruit shippers and packers appear to be in the process of changing. New contracts appear to result from a desire to increase fruit quality, to expand the varieties of fruits offered by shippers, and to increase market share. In the last 2 years, this theme has appeared in many articles in *The Packer*, which reports numerous examples of new formal marketing agreements, horizontal and vertical coordination, and strategic alliances among fruit shippers, growers, and wholesalers.

Anecdotal evidence also suggests that shippers are increasingly engaging in alternative marketing methods. These methods include shipping fruit under private labels, generic advertising, and providing in-store demonstrations of their products (*The Packer*, 11/98). "Give-backs" which include granting volume discounts and paying advertising or slotting fees, are used increasingly as methods to capture space in retail outlets. There are other variations of this kind of pricing system. To be able to sell to retailers, shippers may need to pay a fee in order to be included on the list of suppliers. These practices began in the fruit industry about 5 years ago, and while some shippers complain about them, others feel they are not "getting out of hand" (*The Packer*, 11/98).

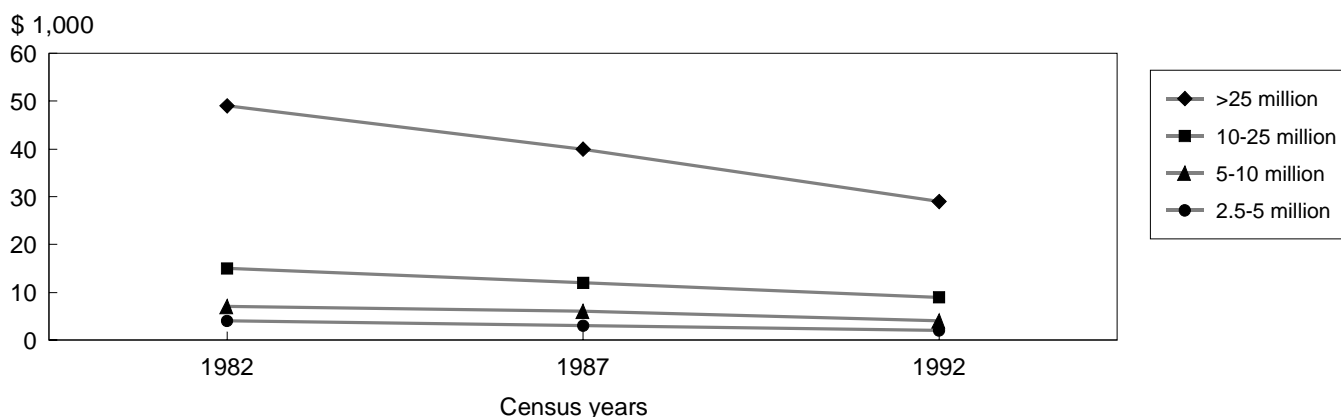
Middlemen: Wholesale Firms

The initial and most thorough study of the fresh fruit and vegetable wholesale industry was completed in 1958 by Alden Manchester. Wholesale produce markets had 5,541 firms, and most were small: 63 percent handled less than 1,000 carloads each year. Manchester's survey revealed that larger markets had larger wholesalers than did small markets. Concentration, however, was higher in smaller markets, and it was not unusual for the four largest firms to handle 95 percent of the trade. In contrast, the four largest wholesale firms in major cities handled 14 to 15 percent of the business.

Data from the Economic Census of the Wholesale Trade indicate that between 1982 and 1992 the average real sales of fresh fruit and vegetable wholesale firms declined (fig. A-10). This trend supports the industry-held perception that wholesalers are being used less frequently than they used to be. Further, the concentration ratio for the four largest merchant wholesale firms, as calculated by the Census, slightly decreased during this period. Agents, brokers, and commissioned merchants are another type of middlemen. They arrange sales, but never take ownership of the produce. Between 1982 and 1992, the average real sales per firm decreased. At the same time, the concentration ratios for the largest four firms slightly increased over the period. Trends in the census data clearly point to declining role of both wholesaling firms and agents, brokers, and commissioned merchants. These trends support the findings of McLaughlin, whose survey indicated that in 1982, 1993, and 1996, retailers were using traditional middlemen less frequently. After the results of the 1997 Census of Wholesale Trade are reported, we'll be able to see whether these trends have continued.

What the data do not show, however, is the emergence of another trend cited by anecdotal evidence—the growing usage of marketing agreements and strategic alliances

Figure A-10
Average Real Sales per Wholesale Firm



Source: Census of Wholesale Trade.

between wholesale firms and shippers, which can be viewed as a form of vertical coordination. *The Packer* reports numerous informal and formal agreements among wholesalers, and between wholesalers and grower/shippers, in efforts to increase market share.

Final Stop before Consumers: Retailers

Mergers and buyouts of grocery stores have been widespread over the past few years. In 1997 and 1998, the Federal Trade Commission investigated many proposed supermarket acquisition agreements, and required divestitures of stores in almost every case. Several large supermarkets—Kroger, Safeway, and Albertsons—merged with smaller chains in 1998, thereby becoming the three largest supermarket chains. The “merger mania,” led to an increase in national grocery store concentration over the past 5 years. For example, in 1993, the top 4 chains served about 17 percent of the market share. In contrast, by 1998, the 4 largest chains (Kroger, Albertson’s, Safeway, and Ahold) will control 28.8 percent of the market (ERS).

The shift towards increasingly large supermarkets has been taking place since at least 1982, and is reflected in ERS data reporting the number of grocery store establishments by category, and grocery store sales by category. Figure A-11 describes average real sizes for supermarkets (defined as grocery stores with sales exceeding \$2.5 million annually, in 1985 dollars), superettes (grocery store with sales below \$2.5 million annually, in 1985 dollars), and convenience stores (a small store selling a limited variety of food and nonfood items) for the census years from 1982 to 1997. Average real sales for supermarkets has increased over time, while average real sales have not dramatically changed for the other two categories.

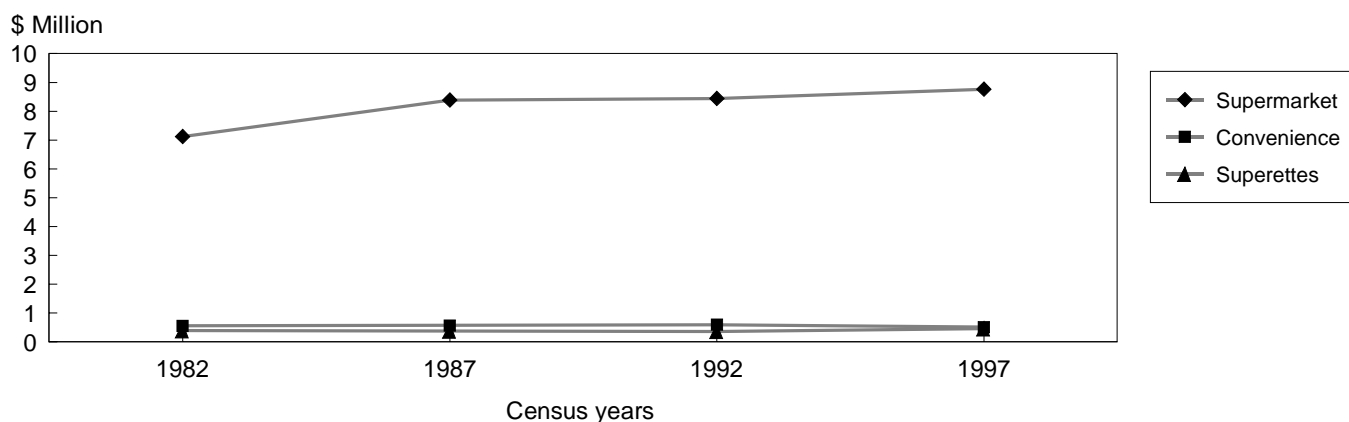
Conclusion

Anecdotal evidence suggests that significant changes in market structure are occurring in the fresh fruit and vegetable industry. On the one hand, it is said that the flow of produce from farm to consumer follows a different path than it once did. Rather than making heavy use of the wholesale terminal market, retailers, large ones in particular, are purchasing a large portion of fruits and vegetables directly from shippers. Farms and supermarkets are thought to be growing in size, while it appears that the wholesaler sector is decreasing in size. It is also claimed that alternative forms of pricing, such as rebates, slotting fees, and other kinds of allowance, are becoming more common. Some industry sources suggest that retail mergers are driving these changes.

Yet, data scarcity makes it difficult to either lend support to or refute many of these notions. For example, the retail practice of buying produce directly from the shipping point is not new, and has been growing since the 1920’s. Further, the available data suggest this trend may be reversing. Census data and ERS data indicate that average farm (both fruit and vegetable) size has been increasing, average wholesale firm size decreasing, and average supermarket size increasing. On the other hand, there are no data available to discuss changes in either the activity or number of shippers. We are also unable to verify whether vertical and horizontal contracts are increasing or decreasing, and where along the farm-to-market chain they are being used. In addition, given the current state of the data, it is nearly impossible to measure the frequency of alternative pricing schemes, such as slotting fees and rebates.

Instead, we are left with a number of puzzles. These include: are the relationships among wholesalers, brokers, growers, and shippers significantly changing? If so, are the changes in

Figure A-11
Average Real Sales per Store



Source: Economic Research Service, USDA.

response to recent supermarket mergers? Or are they being driven by consumer demand for wider variety and high quality produce? Or are there additional factors driving structural change? Have the recent mergers made it possible for retailers to have a bargaining advantage over sellers? And are the alternative business practices an outcome of the competitive pricing strategy, or are they evidence that supermarkets can exert market power over intermediaries and growers? What kind of market structure will characterize the future produce industry? Finally, when considering growers, intermediaries, retailers, and consumers, who will gain and who will lose in the coming years?

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